

Application No.: 10/727,292

Docket No.: JCLA12308

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Present Status of the Application

All pending claims 1, 2 and 11 were rejected under 35 U.S.C. 103(a) as being unpatentable over Shen (US 6,013,771) in view of Lee (US 6,413,557) and Obata (US 6,444,239). In response, Applicants have rewritten claim 1 and submitted the following remarks. No new matter adds through the amendment. Reconsideration of claims 1, 2 and 11 is respectfully requested.

Discussion of Rejections under 35 U.S.C. 103(a)

In the Office Action, Examiner considered that Shen discloses producing from a soybean material an isoflavone rich protein material which is extracted with an aqueous extract and then separated from the *insoluble material* to produce an extract containing isoflavones and protein, and ii) the separation of precipitated protein material from the extract at cool or cold temperatures unexpectedly significantly increases the amount of isoflavones trapped in the separated protein material.

Indeed, Shen teaches that "A vegetable material containing protein and isoflavones is extracted with an aqueous extractant having a pH above the isoelectronic point of the protein material, and the extractant is separated from insoluble vegetable materials to produce an extract containing isoflavones and protein. The pH of the extract is adjusted to about the isoelectronic point of the protein material to precipitate a protein curd containing isoflavones. The protein curd is separated from the extract at a temperature of about 30o F. to about 90o F., and washing of the separated protein curd is avoided to produce the isoflavone rich protein material." Col. 2, lines 47-57.

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However, Applicants would like to respectfully point out that the *insoluble material* in Examiner's remarks should refer to *the residue of the soybean material after being extracted* in Shen, while the insoluble materials in claim 1 do not mean the residue of the soybean material *but should be compared with the precipitates (the protein curd) formed at low temperatures in Shen*.

Applicants have further amended claim 1 for clarification, which reads as:

A method for producing a soluble composition containing isoflavones, comprising:
extracting soybean hypocotyls by water without a physical treatment and removing residue of the soybean hypocotyls through solid-liquid separation to obtain a soybean extract liquid;

adjusting, without a protease treatment and without addition of solubilizing agents, a pH value and a temperature of the soybean extract liquid to 5.5-7 and 0-17°C, respectively, such that insoluble materials are formed in the soybean extract liquid; and

removing the insoluble materials from the soybean extract liquid but recovering soluble materials from the same to obtain a soluble composition containing isoflavones in an amount of 0.2-10wt% in total solid content.

The added description about the isoflavone amount in total solid content is supported by paragraph [0022]. There are at least three features recited in amended claim 1 that are not taught by the cited references as discussed below.

1. One feature of amended claim 1 is that the insoluble materials, which are formed as the pH value and the temperature of the soybean extract liquid are adjusted, are *removed* from the soybean extract liquid, but soluble materials are *recovered*, i.e., the isoflavones is contained and collected in the remaining extract liquid.

Shen clearly teaches away from the above feature. Shen *removes* the liquid part containing soluble materials, but *recovers* the precipitates (the protein curd containing isoflavones) from the low-temperature soybean extract liquid, for believing that low temperatures greatly increase the amount of the isoflavones trapped in the separated

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protein material (col. 3, lines 16-26). Therefore, Shen's method is exactly contrary to the method of this invention.

Moreover, since Shen teaches that the precipitates are rich in isoflavones, one in view of Shen has no motivation to remove the precipitates (=insoluble materials) as in claim 1.

Lee, which was cited for the feature of soybean hypocotyls, also fails to teach or imply the above feature of claim 1. Obata also fails to teach or suggest the feature. Obata teaches in the Abstract to recover, rather than remove, the water-insoluble matter (= precipitates or insoluble materials), as in the case of Shen.

Accordingly, the above feature of amended claim 1 is non-obvious over each or the combination of Shen, Lee and Obata.

2. Another feature of amended claim 1 is that insoluble materials are removed, but soluble materials are recovered after the pH value and the temperature of the soybean extract liquid are adjusted to 5.5-7 and 0-17°C, respectively.

Shen fails to teach the above feature. Shen teaches to adjust the pH value of the soybean extract liquid to the isoelectric point of the protein that is between 4.0 and 5.0 (col. 4, lines 51-62), *because Shen is intended to precipitate most proteins so that most isoflavones co-precipitate with the proteins to form isoflavone-rich protein precipitate (insoluble materials) that is desired by Shen.* In such a case, the isoflavone content in the liquid part is so low that the liquid part is not worth recovering for the soluble materials including isoflavones.

Lee also fails to teach the above feature. Lee even mentions nothing about forming precipitate or insoluble materials from a soybean extract liquid.

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Obata also fails to teach the above feature.

Accordingly, the above feature of amended claim 1 is non-obvious over each or the combination of Shen, Lee and Obata.

3. Still another feature of amended claim 1 is that the soybean hypocotyls are extracted by water without a physical treatment.

Shen fails to teach or imply the above feature. Since soybean flakes are used in the Examples of Shen and soybean flakes *must be obtained with a physical treatment*, the soybean material in Shen is extracted with a physical treatment, as being contrary to the case of claim 1.

Lee, which was cited for the feature of soybean hypocotyls, also fails to teach or imply the above feature of claim 1.

Obata also fails to teach or imply the above feature. As described in Examples 1-3 in columns 4-5 of Obata, a soybean material like defatted soybeans is *ground* and extracted to obtain a soybean extract liquid. It is sure that a grinding treatment is a physical treatment.

Accordingly, the above feature of amended claim 1 is non-obvious over each or the combination of Shen, Lee and Obata.

Moreover, the above difference is technically significant. As indicated by in paragraph [0010] of the specification of this application, when a physically treated raw soybean material is subjected to water extraction, additional components other than isoflavones contained in the raw material, such as proteins or oils, easily exude in large amounts. Therefore, the solubility of the composition containing isoflavones is lowered, or the recovery ratio of isoflavones is lowered in the step of removing the insoluble

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materials.

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For at least the above reasons, Applicants respectfully submit that independent claim 1 patently defines over the prior art.

For at least the same reasons mentioned above, Applicants respectfully submit that claims 2 and 11 dependent from claim 1 also patently define over the prior art.

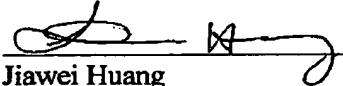
CONCLUSION

For at least the foregoing reasons, it is believed that pending claims 1, 2 and 11 are in proper condition for allowance. If the Examiner believes that a telephone conference would expedite the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

Date: 12/13/2006

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